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(54) Abstract Title
Accessing a Data File in a Data Communication Network

(57) A mobile user terminal for accessing a data file stored in a server computer system in a data communications network comprises a reader for reading a network address identifying the data file from a machine readable label. A transmitter in the user terminal requests, via a wireless communication link, access to the data file on receipt of the network address from the label. The user terminal further comprises a receiver for receiving the data file from the server via the wireless communication link and output means for outputting the data file to a user.

GB 2 327 565 A

FIG. 1

FIG. 2

FIG. 3

400 CPU

410 RAM

420 ROS

430 Wireless Link

440

450 Tag Reader

460 User Input

470 Display

FIG. 4

500 Store

510 Logic

520 RX/TX

530

FIG. 5

Interrogate Tag — 600

Receive URL — 610

Input URL — 620

Request WWW Page — 630

Receive WWW Page — 640

Display WWW Page — 650
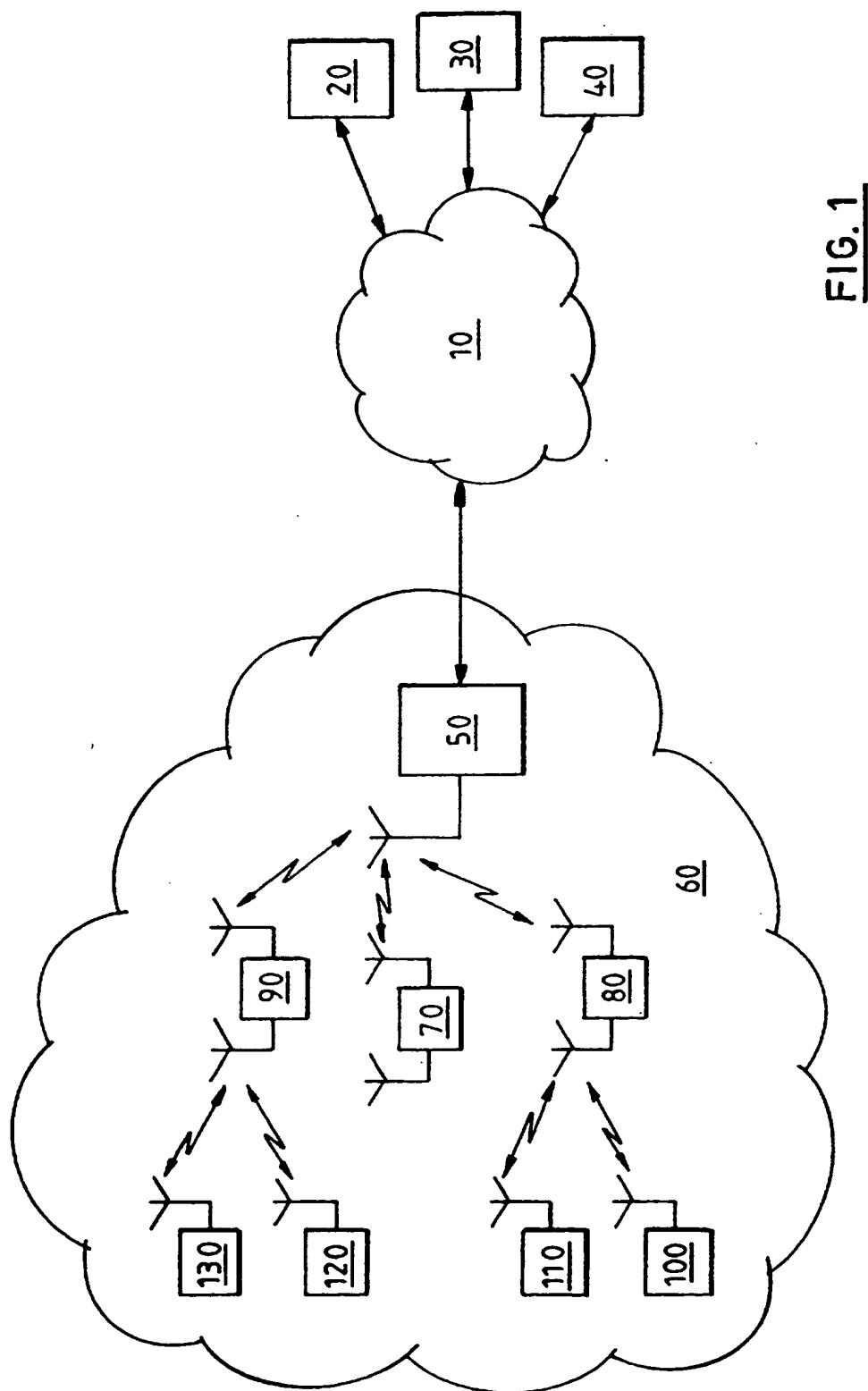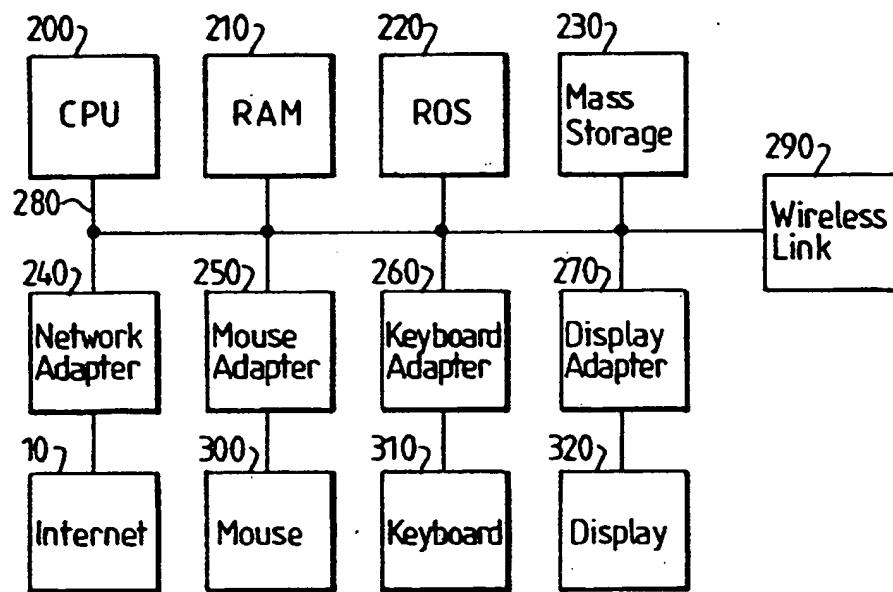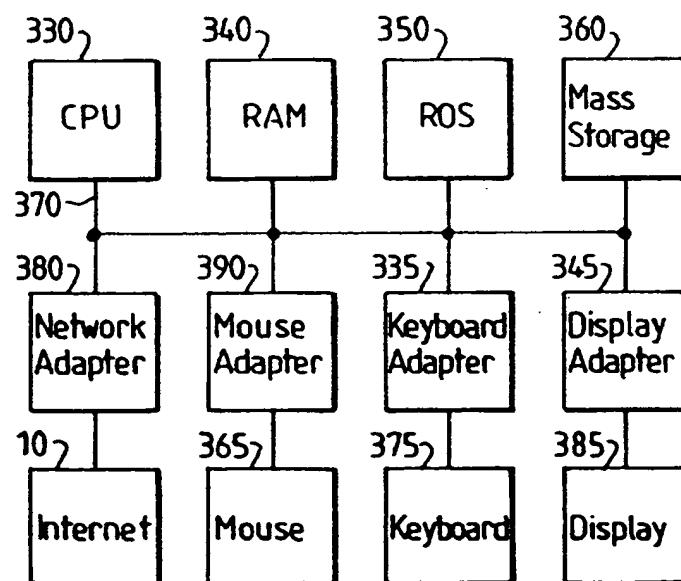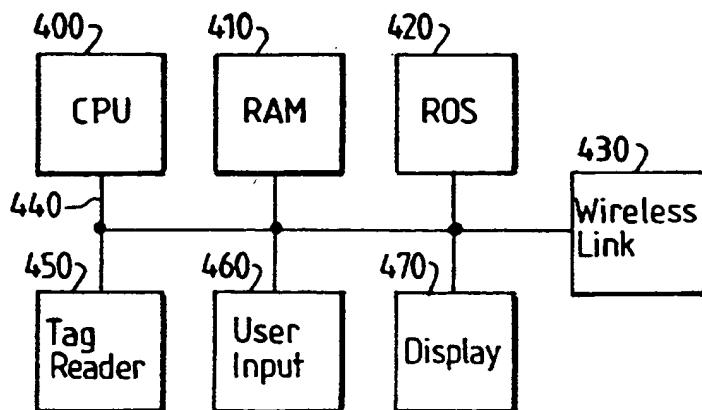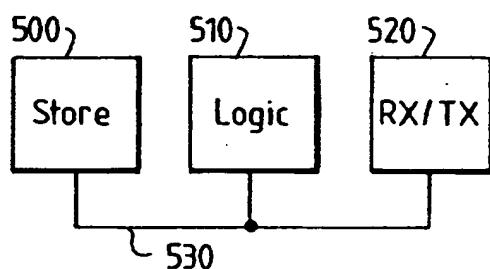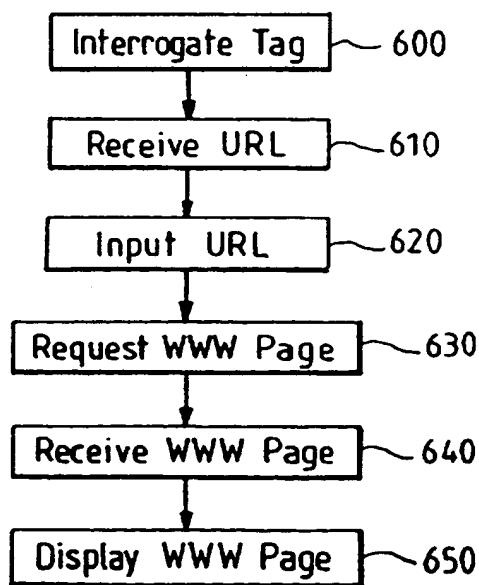
FIG. 6

APPARATUS AND METHOD FOR ACCESSING A DATA FILE IN A DATA
COMMUNICATION NETWORK

The present invention relates to an apparatus and method for
accessing, via a data communication network, a data file relating to an
article.

In recent years, there has been explosive growth in the Internet,
and in particular of the WorldWide Web (WWW), which is one of the
facilities provided via the Internet. The WWW comprises many pages or
files of information, distributed across many different servers. Each
page is identified by an individual address or "Universal Resource
Locator (URL)". Each URL denotes both a server machine, and a particular
file or page on that machine. There may be many pages or URLs resident on
a single server.

Typically, to utilise the WWW, a user runs a computer program
called a Web browser on a client computer system such as a personal
computer. Examples of widely available Web browsers include the
"WebExplorer" Web browser provided by International Business Machines
Corporation in the OS/2 Operating System software, or the "Navigator" Web
browser available from Netscape Communications Corporation. The user
interacts with the Web browser to select a particular URL. The
interaction causes the browser to send a request for the page or file
identified in selected URL to the server identified in the selected URL.
Typically, the server responds to the request by retrieving the requested
page, and transmitting the data for that page back to the requesting
client. The client-server interaction is usually performed in accordance
with a protocol called the hypertext transfer protocol ("http"). The page
received by the client is then displayed to the user on a display screen
of the client. The client may also cause the server to launch an
application, for example to search for WWW pages relating to particular
topics.

WWW pages are typically formatted in accordance with a computer
programming language known as hypertext mark-up language ("html"). Thus a
typically WWW page includes text together with embedded formatting
commands, referred to as tags, that can be employed to control for
example font style, font size, lay-out etc. The Web browser parses the
HTML script in order to display the text in accordance with the specified
format. In addition, an html page also contain a reference, in terms of

another URL, to a portion of multimedia data such as an image, video segment, or audio file. The Web Browser responds to such a reference by retrieving and displaying or playing the multimedia data. Alternatively, the multimedia data may reside on its own WWW page, without surrounding html text.

Most WWW pages also contain one or more references to other WWW pages, which need not reside on the same server as the original page. Such references may be activated by the user selecting particular locations on the screen, typically by clicking a mouse control button. These references or locations are known as hyperlinks, and are typically flagged by the Web browser in a particular manner. For example, any text associated with a hyperlink may be displayed in a different colour. If a user selects the hyperlinked text, then the referenced page is retrieved and replaces the currently displayed page.

Further information about html and the WWW can be found in "World Wide Web and HTML" by Douglas McArthur , p18-26 in Dr Dobbs Journal, December 1994, and in "The HTML SourceBook" by Ian Graham, John Wiley, New York, 1995.

In accordance with the present invention, there is now provided a mobile user terminal for accessing a data file stored in a server computer system in a data communications network, the terminal comprising: means for reading a network address identifying the data file from a machine readable label; means for requesting, via a wireless communication link, access to the data file on receipt of the network address from the label; means for receiving the data file from the server via the wireless communication link, and output means for outputting the data file to a user.

The requesting means preferably comprises a web browser, the data file comprises a world-wide web page, and the network address comprises a Universal Resource Locater. Both the requesting means and the receiving means may comprise a radio frequency transceiver. Likewise, the reading means may comprise a radio frequency receiver. Alternatively however, the reading means comprise a photo-detector.

Th output means may comprise a display device for displaying the data file to the end user. Furthermore, the output means may comprise an

audio output device for generating an audio output as a function of the data file.

It will be appreciated that the present invention extends to a data communications network comprising a server computer system storing a data file at a network address, and a terminal as described above for accessing the data file via a wireless communication link.

Viewing the present invention from another aspect there is provided a label for securing to an article, the label comprising a machine-readable recording of a Universal Resource Locater of a world-wide web page.

Viewing the present invention from yet another aspect there is now provided a method for accessing a data file stored in a server computer system in a data communications network, the method comprising: reading, by a mobile user terminal, a network address identifying the data file from a machine readable label; requesting by the mobile user terminal via a wireless communication link access to the data file on receipt of the network address from the label; receiving, by the mobile user terminal, the data file from the server via the wireless communication link, and displaying, by the mobile user terminal, the data file to a user.

Preferred embodiments of the present invention will now be described, by way of example only, with reference to the accompanying drawings, in which:

Figure 1 is a block diagram of a data communications network;

Figure 2 is a block diagram of a base station server computer system of the data communications network;

Figure 3 is a block diagram of a WWW server computer system as the data communications network;

Figure 4 is a block diagram of a user terminal of the data communications network;

Figure 5 is a block diagram of a tagging device of the data communications network; and,

Figure 6 is a block diagram of logic of the user terminal in the form of a flow chart.

Referring first to Figure 1, a data communication network embodying the present invention comprises the Internet 10 and a wireless network 60. The wireless network 60 comprises a base station server computer system 50, a plurality of user terminals 70-90 for communicating with the base station 50 via wireless communications links and a plurality of tagging devices 100-130 for communicating with the user terminals 70-90 via wireless communications links. The base station 50 of the wireless network 60 is also connected to the Internet 10. A plurality of WWW server computer systems 20-30 are also connected to Internet 10.

Referring now to Figure 2, the base station 50 comprises a random access memory (RAM) 210, a read only memory (ROM) 220, a central processing unit (CPU) 200, a mass storage device 230 comprising one or more large capacity magnetic disks or similar data recording media, a network adaptor 240, a keyboard adaptor 260, a pointing device adaptor 250, a display adaptor 270, and a wireless data link 290, all interconnected via a bus architecture 280. A keyboard 310 is coupled to the bus architecture 280 via the keyboard adaptor 260. Similarly, a pointing device 300, such as a mouse, touch screen, tablet, tracker ball or the like, is coupled to the bus architecture 280 via the pointing device adaptor 250. Equally, a display output device 320, such as a cathode ray tube (CRT) display, liquid crystal display (LCD) panel, or the like, is coupled to the bus architecture 280 via the display adaptor 270. The wireless data link 290 comprises a radio frequency (RF) transceiver.

Basic input output system (BIOS) software is stored in the ROM 220 for enabling data communications between the CPU 200, mass storage 230, RAM 210, ROM 220, adaptors 450-270, and the wireless data link 290 via the bus architecture 280. Stored on the mass storage device 230 is operating system software and application software. The operating system software cooperates with the BIOS software in permitting control of the server 50 by the application software. The application software includes communications software for enabling communication of data between the WWW servers 20-40 and the base station 50 via the network adapter 240 and the Internet 10, and between the user terminals 70-90 and the base station 50 via the wireless link 390.

Referring now to Figure 3, each WWW server 20-40 comprises a RAM 340, a ROM 350, a CPU 330, a mass storage device 360 comprising one or more large capacity magnetic disks or similar data recording media, a network adaptor 380, a keyboard adaptor 335, a pointing device adaptor 390, and a display adaptor 345 all interconnected via a bus architecture 370. A keyboard 375 is coupled to the bus architecture 370 via the keyboard adaptor 335. Similarly, a pointing device 365, such as a mouse, touch screen, tablet, tracker ball or the like, is coupled to the bus architecture 370 via the pointing device adaptor 390. Equally, a display output device 385, such as a CRT display, LCD panel, or the like, is coupled to the bus architecture 370 via the display adaptor 345.

BIOS software is stored in the ROM 340 for enabling data communications between the CPU 330, mass storage 360, RAM 340, ROM 350, and adaptors 380, 390, 335, and 345 via the bus architecture 370. Stored on the mass storage device 360 is operating system software and application software. The operating system software cooperates with the BIOS software in permitting control of the server 20-40 by the application software. The application software includes communications software for enabling communication of data between the server 20-40 and the base station 50 via the network adapter 380 and the Internet 10. Also stored on the mass storage device 360 is a WWW page.

Referring now to Figure 4, each of the user terminals 70-90 comprises a housing (not shown) shaped and configured to be hand-held. Contained in the housing is a CPU 400, a RAM 410, a ROM 420, a tag reader 450, a user input 460, a display 470 and a wireless data link 430 all interconnected by a bus architecture 440. The wireless data link 430 and the tag reader 450 each comprise an RF transceiver. The RF transceiver of the tag reader 450 has a directional antenna for directing at individual tagging devices 100-130. The display 470 comprises a flat panel display such as an LCD panel and the user input 460 comprises a touch sensitive screen overlaying the flat panel display for actuation by a stylus, finger or the like.

BIOS software is stored in the ROM 420 for enabling data communications between the CPU 400, RAM 410, ROM 420, display 470, user input 460, tag reader 450, and wireless data link 430 via the bus architecture 440. Also stored in the ROM 420 is operating system software and application software. The operating system software cooperates with the BIOS software in permitting control of the user terminal 70-90 by the application software. The application software comprises a web browser

for accessing, via the wireless link 430, the base station 50, and the Internet 10, WWW pages stored on WWW servers 20-40 and for displaying WWW pages read from WWW server 20-40 on the display screen 470. The application software also includes communication software for reading, via the tag reader 450, data from the tagging devices 100-130 and for supplying, via the wireless link 430, data read from the tagging devices 100-130 to the base station 50. In some embodiments of the present invention, the user terminal may comprise an audio output device for generating an audio output as a function of the WWW pages.

Referring now to Figure 5, each of tagging devices 100-130 comprises a data store 500, control logic 510 and a wire data link 520 all interconnected by a bus architecture 530. The wireless data link 520 comprises an RF transceiver. The data store 500 contains a URL identifying one of the WWW pages stored on WWW servers 20-40. Each tagging device 100-130 further comprises adhesive pad for securing the device 100-130 to an article to be tagged.

Referring now to Figure 6, in operation, the communication software in each of the user terminals 70-90 generates a menu of possible actions on the display screen 470. The menu includes an icon representative of an acquire action. The user selects the acquire action by depressing the touch screen 460 in the region overlaying the associated icon. At step 600, on selection of the acquire action, the CPU 400 instructs the tag reader 450 to issue an interrogation signal. The wireless data link 520 of any tagging device 100-130 within range of the directional antenna detects the interrogation signal. The interrogation signal provides the interrogated tagging device 100-130 with sufficient power to drive the transceiver of the wireless link 520, the data store 500 and the logic 510. On detection of the interrogation signal by the wireless data link 520, the logic 510 retrieves the URL stored in the data store 500. The logic 510 transfers the retrieved URL to the wireless data link 520. In turn, the wireless data link 520 transmits the URL received from the logic 520 to the user terminal 70-90 issuing the interrogation signal. At step 610, the tag reader 450 of the interrogating user terminal 70-90 receives the URL from the interrogated tagging device 100-130. At step 620, the CPU 400 activates the web browser and inputs the received URL. At step 630, the web browser instructs the CPU 400 to communicate the received URL to the base station 50 via the wireless data link 430. The wireless data link 290 of the base station 50 receives the URL from the interrogating user terminal 70-90. The base station 50 retrieves the WWW

page specified by the received URL from the associated WWW server 20 to 40 via the Internet 10. At step 640, the WWW page obtained from the Internet 10 is sent by the base station 50 to the interrogating user terminal 70-90 via the wireless data link 290. At step 650, the interrogating user terminal displays the received WWW page to the user of the display screen 470.

In the preferred embodiment of the present invention hereinbefore described, the wireless data link 290 of the base station 50, the wireless data link 430 and the tag reader 450 of each user terminal 70-90, and the wireless data link 520 of each tagging device 100-130 each comprises an RF transceiver. However, it will be appreciated that, in other embodiments of the present invention, the wireless data link 520 of each tagging device 100-130 and the tag reader 450 of each user terminal 70-90 may each comprise a transceiver for effecting a different form of wireless communication, such as an Infra-red transceiver for example. Equally, it will be appreciated that, in other embodiments of the present invention, the wireless data link 290 of the base station 50 and the wireless data link 430 of each user terminal 70-90 may likewise each comprise a transceiver for effecting a different form of wireless communication, such as an Infra-red transceiver for example.

Furthermore, in the preferred embodiment of the present invention hereinbefore described, the user input 460 each user terminal 70-90 comprises a touch-sensitive screen. However, it will be appreciated that, in other embodiments of the present invention, the user input 460 may comprise a different form of input transducer, such as a keyboard or the like.

Still furthermore, in the preferred embodiment of the present invention hereinbefore described, a URL associated with a WWW page is stored in a data store 500 of a tagging device 500-520 having logic 510 and a wireless data link 520 for transmitting the URL in response to an input interrogation signal. However, it will be appreciated that in other embodiments of the present invention the URL may be encoded on the tagging device in the form of a bar code, in a magnetic stripe, or in a similar machine-readable label, with the tag reader 450 of each user terminal 70-90 being equipped to read such a label when directed towards a selected tagging device 100-130. For example, in embodiments of the present invention in which the URL is encoded on a tagging device 450 in the form of a bar code, the tag reader 450 of each user terminal 70-90

may comprise a photo-detector for reading the bar code. Alternatively, in embodiments of the present invention in which the URL is encoded on a tagging device 100-130 in a magnetic stripe, the tag reader 450 of each user terminal 70-90 may include a the magnetic read head for reading the
5   URL from the stripe.

In the present embodiment of the present invention hereinbefore described, the wireless data link 520 of each tagging device 100-130 obtains operating power from the received interrogating signal. However,
10   it will be appreciated that, in other embodiments of he present invention, the tagging devices 100-130 may be battery-powered.

Furthermore, in the preferred embodiment of the present invention hereinbefore described, each tagging device 100-130 comprises an adhesive
15   pad for securing the device to anther article. It will be appreciated that in other embodiments of the present invention, each tagging device may be securing to an article by other fixings, such as magnetic, nut and bolt, screw, clip, or the like. It will also be appreciated that, in some embodiments of the present invention, the tagging devices 100-130 may be
20   integral to the articles to be tagged.

In preferred applications of the embodiment of the present invention hereinbefore described, each tagging device 100-130 is secured to a different article. A different URL is stored in each tagging device
25   100-130. Each URL corresponds to different WWW page stored in server 20-40. Each WWW page includes information relating to the article to which the tagging device containing the corresponding URL is secured. Thus, when a selected tagging device 100-130 is interrogated, information relating to the article tagged is down-loaded via the internet 10 and the
30   base station 50 for display on the interrogating user terminal 70-90.

In one such application, the wireless network 60 is deployed in a shop in which the tagging devices 100-130 are secured to items on sale. Customers are each supplied with one of the user terminals 70-90 to
35   enable them to remotely access from the Internet 10 information relating to selected items on sale. Such information may include, for example, pricing, health warnings, technical specifications, or assembly instructions.

40   In another application, the wireless network 60 is again deployed in a shop, but the tagging devices 100-130 are secured to the display

fixtures on which items for sale are displayed rather than to the items themselves. Again customers are each supplied with one of the user terminals 70-90, but in this case they access from the Internet 10 information relating to selected items on sale by interrogating the tagging device 100-130 secured to the fixture on which the selected items are displayed.

In a further application, the wireless network 60 is deployed in a museum, and the tagging devices are secured to exhibits. Visitors to the museum are each supplied with one of the user terminals 70-90 to access from the Internet 10 information relating to the exhibits.

In yet another application, the tagging devices 70-90 are secured to stops and stations in a public transport network and the transport time-tables are included in the corresponding web pages. In use, travellers equipped with the user terminals 70-90 remotely access the WWW page containing the time-table relevant to the stop or station they are waiting at. For the transport service provider, this arrangement avoids the expense of providing and maintaining complex customer information systems at remote stops or stations. Time-tables can be revised centrally, in view of delays, equipment failures etc, simply by updating the information contained in the relevant WWW page or pages stored on the or each server 20-40.

By way of summary then, in the embodiments of the present invention hereinbefore described there are provided systems and methods in which an article is tagged with a URL identifying the address of an internet resource containing information relating to the article. The tag may be a bar code or equivalent physical marking, an attached or embedded RF transceiver, or other similar mechanism. A portable web browsing device is then employed for making connection to the internet, reading the URL tags on the articles, down-loading the corresponding internet resources and displaying them.

CLAIMS

1.   A mobile user terminal for accessing a data file stored in a server computer system in a data communications network, the terminal comprising: means for reading a network address identifying the data file from a machine readable label; means for requesting, via a wireless communication link, access to the data file on receipt of the network address from the label; means for receiving the data file from the server via the wireless communication link, and means for outputting the data file to a user.

2.   A terminal as claimed in claim 1, wherein the requesting means comprises a web browser, the data file comprises a world-wide web page, and the network address comprises a Universal Resource Locater

3.   A terminal as claimed in claim 2, wherein the requesting means and the receiving means each comprise a radio frequency transceiver.

4.   A terminal as claimed in any preceding claim, wherein the reading means comprises a radio frequency receiver.

5.   A terminal as claimed in any claim preceding claim 4, wherein the reading means comprises a photo-detector for reading a bar-code.

6.   A terminal as claimed in any preceding claim, wherein the output means comprises a display device for displaying the data file to the end user.

7.   A terminal as claimed in any preceding claim, wherein the output means comprises an audio output device for generating an audio output as a function of the data file.

8.   A data communications network comprising a server computer system storing a data file at a network address, and a terminal as claimed in any preceding claim for accessing the data file via a wireless communication link.

9.   A label for securing to an article, the label comprising a machine-readable recording of a Universal Resource Locater of a world-wide web page.

10.   A method for accessing a data file stored in a server computer
system in a data communications network, the method comprising: reading,
by a mobile user terminal, a network address identifying the data file
from a machine readable label; requesting by the mobile user terminal via
a wireless communication link access to the data file on receipt of the
network address from the label; receiving, by the mobile user terminal,
the data file from the server via the wireless communication link, and
displaying, by the mobile user terminal, the data file to a user.

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Patent
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Application No: GB 9714853.0	**Examiner:** Nigel Hall
Claims searched: 1-8,10	**Date of search:** 22 September 1997

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Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.O): H4L (LDA, LDG, LDLX)

Int Cl (Ed.6): H04Q 7/22

Other: Online: WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
Y	EP 0703463 A2 (AT&T) See whole doc	1,10 at least
X,Y	WO 94/11967 A1 (WEEKS) See especially p.15 line 25-p.16 line 10	1,10 at least
Y	WPI Abstract Accession No. 96-269219/199628 & DE 4443018 A1 (ACCUMULATA)(See abstract)	1,10 at least